AGRICULTURAL RESEARCH SERVICE, U. S. DEPARTMENT OF AGRICULTURE

ARS-44-141

Dairy-Herd-Improvement Letter (Vol. 40, No. 3)

April 1964

INCREASING THE USEFULNESS OF DHIA RECORDS

The principle byproduct of dairy recordkeeping is the 305-day production record of the individual cow. These individual records, as used by dairymen, DHIA supervisors, county agricultural agents, State extension specialist and researchers, the AI industry, and the USDA are important and essential tools for herd improvement.

The lactation records from DHIA herds are routinely forwarded by the States to the Animal Husbandry Research Division, USDA, for use in sire evaluation and research. In order to obtain the greatest possible accuracy in these sire summary and research efforts, approximately 20 percent of the automatic data processing (ADP) activities are devoted to editing incoming and previously reported records. These ADP edits involve (1) checking for apparent erroneous data in current records received since the previous sire evaluation and (2) checking on the consistency of current records as compared to data previously reported for the same animal. As a result, inconsistent records (either current or previously reported or both) are excluded from master files, tabulated, and returned to the respective States on Form DHIA-1060. After correction or verification, the records are returned to the master files.

A total of 484,318 DHIA lactation records were reported to the USDA from November 1, 1963, to February 1, 1964. Of these, editing procedures resulted in the exclusion of 40,974

Issued May 1964

or 8.4 percent. The relative frequency of the different types of errors or conflicts is shown in table 1. The alphabetic codes are used to classify types of conflicts and are further described on Form DHIA-1060-A, a copy of which is shown on pages 9 and 10. Of the 24 types of conflicts shown in table 1, only the first seven appear to be significant in terms of frequency and collectively represent 92.6 percent of all errors. These common types of conflicts are illustrated on page 11 and are as follows:

Code D (Birth date)

The most common source of conflict was birth date which represented 22.5 percent of all records in question. An example of the code D type of error is shown on page 11. In many instances this conflict in birth date represents a difference of only one day, month, or year and usually results from a recording error.

The frequency of conflicts in birth date is high largely because the apparent error in the current record results in the removal of all previously reported lactations of the cow in question. An average of three to four records previously reported are removed from master files for each current record involved.

Code F (Possible twins)

When two cows are reported with the same parents and birth date, they are twins, or an error has been made in identifying and reporting a combination of cow, sire, and dam number and birth date, or any one of these. Past experience indicates that these rejects represent erroneous reporting rather than twins more than 50 percent of the time. When cows in question are verified as being twins, the corresponding records are returned to the master files and not removed again for this reason.

Code F conflicts often result from legitimate changes in the eartag numbers of cows. In such cases, it is recommended that lactations reported after a change in eartag number be either positively identified as such or reported with the original eartag number. The latter is preferred in reporting records to the USDA.

An example of code F conflicts, representing 18.4 percent of all rejects, is shown on page 11.

Code M (Eartag identification)

Errors or conflicts in eartag number represent 15.4 percent of all rejects. These usually represent errors in identifying and reporting eartags, and in many instances, involve the use of invalid numbers.

Code Q (Calving date)

Apparent conflicts in calving date represent 14 percent of all rejects. A portion of these questionable records result from the sale of cows in milk from one tested herd to another which results in the reporting of two lactations with the same calving date but with different values for days in milk. Edits are also made for calving interval less than 9 months in duration. These types of rejects can and will be reduced by further ADP editing, and it is expected that code Q types of conflicts will decrease in frequency in the future. An example of this type of error is shown on page 11.

Code B (Dam number)

Approximately 75 percent of all code B rejects appear to result from errors in recording the eartag or registration number of the dam in later records of cows. For example, the dam of a cow was previously reported in three records as number 4264059, but as 4264095 in a current lactation. Another example of code B type of error is shown on page 11.

Code A (Registered sire number)

The majority of code A conflicts represent current records which do not result in rejecting previously reported information. Consequently, the frequency of questionable sire identification among current records is higher than the 7.4 percent reject-rate shown in table 1. Many of these rejects represent recording errors in which the registration number of the sire is too large or too small for the appropriate breed. Occasionally, the source of error is in breed identification.

Canadian registration numbers should be prefaced by an 01. For example, a registered Canadian Holstein with number 123456 should be recorded and reported to the USDA as 010123456.

A general realization of the range in U. S. registration numbers for cows having current records can be helpful in reducing obvious errors. The normally expected limits are shown below. One would not find, for example, a current record made by a registered Holstein with a number other than 7 digits in length. Further, this registration number would begin with either a 3, a 4, or a 5. The registration numbers in currently reported records will usually be between the limits shown below. Exceptions will include Canadian registration numbers, cows registered prior to 1950, and sires and dams registered prior to 1945.

Expected range in U. S. registration numbers of cows and sires having current records

	Cow		Dam	
Breed	Reg. in 1950	Reg. in 1963	Reg. in 1945	Reg. in 1960
Ayrshire	400000	650000	300000	620000
Guernsey	1200000	2200000	900000	2100000
Holstein	3100000	5900000	2300000	4900000
Jersey	1700000	2500000	1400000	2400000
Brown Swiss	220000	450000	140000	410000

	Sire	
Breed	Reg. in 1945	Reg. in 1960
Ayrshire	80000	123000
Guernsey	379000	553000
Holstein	956000	1400000
Jersey	460000	590000
Brown Swiss	72000	139000

Code H (Identification of parents)

Code H rejects may involve either sire or dam conflicts

in identification or both. These conflicts may be the source of error, or different cows may be involved. In some instances, copy errors are made in identifying parents, especially when cows move from one herd to another. The frequency of code H rejects is 4.7 percent.

Often it is not possible to correctly identify the source of error among rejected records. An apparent code Q reject suggests an error in calving date and, for example, may result from two lactation records of a cow having fresh dates differing by only 6 months but with a 305-day initial record. In this instance, it is quite possible that two cows are involved and that an error was made in a cow identification rather than calving date. Similar interrelationships between possible source of conflicts occur in each of the more frequent error codes. In over 90 percent of the rejected records, however, the source of error can be traced to identification number (cow, sire, and dam), birth date, and/or calving date. These conflicts can be eliminated by the following:

1. Correct initial identification and reporting of the eartag or registration number of cow, sire, and dam.
2. Consistent reporting of identification in later records of cows.
3. Correct and consistent reporting of birth dates.
4. Correct reporting of calving dates.

Another inadequacy in the data reported is not specificially shown in table 1. Approximately 21 percent of all DHIA lactation records in the master files have no sire identification. They are used as herdmate information, but even in this respect they are not entirely satisfactory since paternal half-sisters should be excluded from herdmates.

In addition to the above-mentioned problem areas, special attention should be devoted to increased accuracy in reporting conditions-affecting-record (CAR) and status codes. Abnormal conditions and disposals should be reported with care.

Further editing efforts by the USDA are under way--in order to use ADP procedures to (1) make logical decisions in correcting obvious recording errors, and (2) remove from master files only those records that have not been consistently reported in the past. The major and important role in the correct reporting of DHIA records, however, remains the re-

sponsibility of each supervisor. Further efforts in this important part of dairy recordkeeping will benefit all who make effective use of the information from the Nation's 2,010,144 DHIA cows.

OWNER-SAMPLER HERD SUMMARIES

The first summary of Owner-Sampler herd averages was made in March 1964, and the results are tabulated in table 2. A total of 423,545 cows in 14,761 herds were represented with an average production of 10,606 pounds of milk and 396 pounds of fat. These averages are shown by State in table 2 and represent the 1962-63 testing year.

Complete reports were available from only, 4,615 Owner-Sampler herds. They represented 136,781 cows averaging 10,785 pounds of milk and 402 pounds of fat. Other reported national averages per cow were 1,200 pounds live weight, 83 percent days in milk, 3,700 pounds concentrates fed, 8,300 pounds succulent forage fed, 4,600 pounds dry forage fed, 147 days on pasture, 114 feeding index, $460 for value of product, $113 for cost of concentrates, $219 for feed cost, $241 for income over feed cost, and $2.03 for feed cost per hundred weight of milk.

9,413 SIRES SUMMARIZED IN MARCH 1964

A total of 9,413 sires were summarized in March 1964, 9,359 of which included progeny with production—listed herdmates. The 2,211 AI sires represented 591,577 progeny with herdmates and averaged 268 daughters per sire. The 7,148 non-AI sires represented 110,610 progeny with herdmates and averaged 15 daughters per sire.

Included in the summary were 950 bulls having 200 or more AI progeny indicated in previous evaluations. Consequently, many of these summaries represent bulls that have been inactive for some time.

Forty-seven percent of the AI bulls summarized maintained or increased milk yield and 50 percent maintained or increased fat yield. The corresponding values for non-AI bulls were 45 and 49 percent, respectively. As shown in tables 3 and 4, both AI and non-AI progeny consistently exceed their herdmates in percentage of fat test. These summaries continue to indicate that, in general, sires have been selected more for percentage of fat, or possibly fat yield, than for milk yield.

A total of 30,312 sire records were sent to the cooperating States. These, and further results from the March 1964 summary, are shown in table 5.

NOTE

The January 1963 milk production in the U. S. was 10,066 million pounds and was the first month since November 1962 that milk production was equal to or greater than a year earlier. On February 1, 1963, reporters fed 9.1 pounds of concentrates per cow or 2 percent more than 8.9 pounds fed a year earlier and 1.4 pounds more than the 1958-62 average of 7.7 pounds for the date.--From USDA, Statistical Reporting Service (2-64)

Table 1.--Relative frequency of lactation rejects

Code	Type	Frequency Pct.
D	Birth date	22.5
F	Possible twin	18.4
M	Eartag identification	15.4
Q	Calving date	14.0
B	Registered dam number	10.2
A	Registered sire number	7.4
H	Identification of parents	4.7
E	Breed	1.4
I	Cow number	1.3
P	Blanks and/or alphabetic production	1.3
R	Unusual percent test	1.3
T	Production	0.6
V	Days in milk	.4
J	Same identification numbers	.3
W	Identification conflicts	.3
C	Registration number (cow, sire, or dam)	.2
Y	(USDA use only)	.2
G	State code	.1
K	(USDA use only)	.0
N	(USDA use only)	.0
O	Conflicting corrections (identification)	.0
S	Conflicting corrections (production)	.0
U	Days carried calf	.0
X	Unusual number of records by cow	.0
	Total	100.0

DHIA-1060-A (5-61)

INTERPRETATION AND USE OF ERROR CODES FOR LACTATION RECORDS ON FORM DHIA-1060

Lactation records containing errors, conflictions or omissions are listed by the EDPM-IBM-705-III on Form No. 1060 and returned to State Extension Dairymen. Records in error are listed by Herd Code making it possible for the Extension Dairyman to return the questioned records to the Supervisor for correction or verification. These lists are prepared from an edit run of the current data reported since the last Production Run and from updating the Master File of lactation records.

An alphabetic code is listed with the record in the column "Err Code," which indicates the first reason for which the record was rejected. A record may contain other errors as the machine stopped checking once an error was detected. Therefore, the entire record should be checked.

In cases where one record is in conflict with other records in the Master File, all related records have been removed from the file and listed. All records in the group must be checked as the discrepancy may be in one or more of the related records instead of the current report.

NOTE: All records listed have been removed from the Master File and, therefore, cannot be used in proving sires until the records have been corrected and/or verified and are returned for re-entry into the Master File.

Corrections and notes should be made on the lists. The corrected lists should be returned to the State Extension Dairyman for forwarding to the Dairy Cattle Research Branch, ARS, USDA.

The alphabetic codes are listed below with an explanation of the probable error, together with a suggested action for correction:-

Code	Interpretation	Suggested Action
A.	Registered Sire Number	
	1. Zero or conflicting numbers; or, 2. Number higher or lower than high or low number for Breed	Give correct registration number for Sire
B.	Registered Dam Number	
	1. Zero or conflicting numbers; or, 2. Number higher or lower than high or low number for Breed (including dam of eartagged cow) 3. Alphabet in registered number of dam of eartagged cow.	Give correct registration number for Dam
C.	Registered Number (Cow, sire or dam)	
	1. Number reported with blanks and/or alphabetic characters (except Milking Shorthorn or Red Dane)	Give correct registration number
D.	Birthdate	
	1. Month - Zero or higher than 12; or 2. Day - Zero (registered identification) or higher than 31; or, 3. Year - Zero; or, 4. Month or Year contains blank or alphabetic characters; or, 5. Different birthdate reported for same cow	Give correct date of birth
E.	Breed	
	1. Zero; or, 2. Different breed reported for registered cow, sire and/or dam; or, 3. Different breed of dam reported for same cow	Give correct breed
F.	Possible Twin	
	1. Equal birthdates for 2 or more daughters of same dam; or, 2. Less than 9 months between birthdates of 2 or more daughters of same dam	Verify or correct cow number and/or dam number and birthdate
G.	State Code - Identification and/or herd code	
	1. Erroneous State code; or, 2. Zero herd code (birthdate after 10-59)	Give correct State Code Give correct Herd Code

Code	Interpretation	Suggested Action
H.	Identification	
	1. Two or more errors; or,	Check complete identification
	2. Conflicting identification on two or more records; or,	
	3. Registered dam number higher than cow number (except Milking Shorthorn)	Check cow and dam numbers
I.	Cow Number	
	1. Number lower than table of registrations; or,	Check birthdate and/or cow number and or breed
	2. Cow number higher than last number issued by Breed Association; or,	
	3. Record for Milking Shorthorn, Red Dane or Red Poll coded as CHB	
J.	Equal Identification Number	
	1. Cow, sire and/or dam; or,	Check all identification numbers
	2. Sire and dam	
M.	Eartag Identification	
	1. Private tag; or,	Give correct identification number
	2. Disease tag (birthdate later than 1-57); or,	
	3. Incorrect number; or,	
	4. Number contains blanks	
	5. Class Milking Shorthorn or Red Dane	
N.	Cross Reference Number	
	(For use of USDA office only)	No action
O.	Conflicting Corrections - Identification	Verify or correct complete identification
P.	Blanks and/or alphabet in lactation report	Give correct lactation data
Q.	Calving Date	
	1. Month - Zero or higher than 12; or,	Give correct dates
	2. Day - Higher than 31; or,	
	3. Year - Zero or conflicts with current date; or,	
	4. Calving date earlier than birthdate; or,	
	5. Less than 9 months between lactations; or,	
	6. Less than 14 months between birthdate and calving date	
R.	Percent Test	
	1. Too high or low for breed	Verify or correct milk and butterfat production, and Breed
S.	Conflicting Corrections - Production	Give correct production data
T.	Production	
	1. Equal production with unequal calving dates; or,	Give correct calving and/or production data
	2. 2x and 3x milking reported with same calving date; or,	
	3. Zero milk or fat	
U.	Less than 30 days between days carried calf and days in milk	Give correct days carried calf
V.	Days in Milk	
	1. Zero or higher than 305; or,	Give correct days in milk or days milked 3x
	2. Days milked 3x higher than 31; or,	
	3. Days in milk lower than 3x milking days	
W.	Identification conflicts with data from Breed Association	Verify or give correct identification data
X.	More than 20 complete records for same cow; or, More than 5 incomplete records for same cow	Check identification and records
Y.	(For use of USDA office only)	No action

ILLUSTRATIONS OF LACTATION RECORD REJECTS

HERD CODE	COW NUMBER	COW BR.	SIRE NUMBER	SIRE BR.	DAM NUMBER	DAM BR.	DATE OF BIRTH MO.	DAY	YR.	DATE FRESH MO.	DAY	YR.	NUMBER DAYS DRY	C.C.	SX	IN MILK	MILK ID LB.	% TEST	FAT LB.	C.A.R.	BO. CWT.	TYPE SC.	FEED. INDEX	HERD AV. MILK 10 LB.	HERD AV. FAT LB.	ERR. CODE	H T	1/
29040014	29WAE0326	3	001189195	3	29ZZG6899	3	12	05	59	09	20	63	00	00	00	263	0800	3.6	0284	0	100		000	0000	000	D		*3c
29040014	29WAE0326	3	001189195	3	29ZZG6899	3	03	26	60	09	03	62	00	00	00	256	0489	4.5	0218	0	080		000	0000	000	D		3c
29559017	2397202	4	000499207	4	002109415	4	08	16	58	08	18	62	04	00	00	305	1044	5.1	0534	0	090		111	0000	000	F		3c
29559017	29WAA2697	4	000499207	4	002109415	4	08	16	58	09	12	60	00	00	00	305	0824	5.1	0420	0	060		058	0000	000	F		*3c
29750011	29AAQ0813	3	000000000	0	2900Q0157	3	02	11	56	04	16	59	00	00	00	294	1160	3.8	0443	0	000		000	0000	000	M		3c
29750011	29AAQ0813	3	000000000	0	2900G0157	3	02	11	56	04	29	62	00	00	00	289	1311	4.3	0559	0	120		000	0000	000	M		3c
29050009	004182170	3	001117014	3	003757961	3	12	06	55	12	29	61	00	00	00	269	1317	3.2	0426	0	140		007	0000	000	Q		*3c
29050009	004182170	3	001117014	3	003757961	3	12	06	55	01	22	62	12	00	00	245	1185	3.2	0385	0	120		000	0000	000	Q		3c
29750087	004426177	3	001123999	3	003519538	3	08	08	57	06	22	60	00	00	00	305	1474	3.5	0517	0	000		000	0000	000	B		*3c
29750087	004426177	3	001123999	3	003519518	3	08	08	57	10	21	61	00	00	00	305	1689	3.7	0624	0	000		000	0000	000	B		3c
29149063	005113043	3	010255164	3	011114297	3	04	10	57	08	14	61	07	00	00	276	0997	3.5	0345	0	130		000	0000	000	A		*3c
29149063	005113043	3	001261368	3	011114297	3	04	10	57	08	08	62	08	00	00	298	1046	3.4	0361	0	130		000	0000	000	A		3c
29090135	29WAA3702	4	000506697	4	290194071	8	11	16	56	08	08	61	00	00	00	297	0835	4.2	0352	0	000		000	0000	000	H		*3c
29090135	29WAA3702	2	000506697	2	29WAK7222	3	11	15	56	09	06	62	00	00	00	305	0886	5.6	0492	0	100		000	0000	000	H		3c

1/ Codes used by USDA where 3c represents 1963, third evaluation and * denotes a master file or previously reported record.

Table 2.--Summary of the 1962-63 Owner-Sampler cow-year production averages, by State 1/

State Code	State Name	Herds	Cows	Average Production Milk	Fat	Fat
		No.	No.	Lbs.	Pct.	Lbs.
11	Maine	75	2,374	10,668	3.9	411
12	New Hampshire	51	1,381	9,913	4.0	392
13	Vermont	314	10,713	8,994	4.1	366
14	Massachusetts	60	1,772	10,623	4.0	420
15	Rhode Island	5	225	8,840	4.2	369
16	Connecticut	57	1,920	10,967	3.9	429
21	New York	1,802	60,056	11,263	3.6	411
22	New Jersey	14	433	10,452	4.0	413
23	Pennsylvania	1,019	27,339	10,361	3.8	397
31	Ohio	546	12,711	10,906	3.8	411
32	Indiana	177	4,596	10,608	3.9	414
33	Illinois	264	7,558	10,905	3.8	412
35	Wisconsin	8,624	246,415	10,564	3.7	392
41	Minnesota	663	16,555	10,646	3.7	390
42	Iowa	722	17,188	10,345	3.7	387
43	Missouri	7	172	8,928	4.0	358
45	North Dakota	12	211	9,543	3.7	349
46	South Dakota	15	446	9,458	3.5	335
47	Nebraska	25	894	10,563	3.6	378
48	Kansas	61	1,705	9,899	3.7	369
50	Delaware	17	423	10,100	4.0	408
51	Maryland	71	2,784	10,287	3.8	394
52	Virginia	62	1,851	10,844	3.8	412
54	West Virginia	18	618	8,367	4.0	334
55	North Carolina	18	624	9,678	3.9	380
56	South Carolina	3	234	8,142	3.6	293
58	Florida	3	219	9,395	4.3	405
61	Kentucky	1	19	10,052	3.6	363
63	Tennessee	1	14	8,456	4.3	366
64	Alabama	3	176	9,180	3.9	356
65	Mississippi	1	14	6,567	3.7	242
71	Arkansas	15	458	9,340	3.8	358
73	Oklahoma	5	198	9,071	3.8	341
74	Texas	3	153	8,982	3.4	305
81	Montana	5	205	10,803	3.9	421
82	Idaho	4	195	11,783	3.6	429
83	Wyoming	5	185	9,783	3.6	349
84	Colorado	6	183	10,961	3.7	402
86	Arizona	4	268	11,947	3.8	454
87	Utah	1	22	13,917	3.7	512
92	Oregon	2	41	9,896	4.3	422
Total or average		14,761	423,545	10,606	3.7	396

1/ Includes all production data reported.

Table 3.--Performance of AI sires summarized in March 1964, as measured by the production of progeny and their herdmates

Breed	Sires			Daughters with Herdmates	Daughters Average Production			Herdmates Average Production		
	Total	Milk Yield Maintained or increased	Fat Yield Maintained or increased		Milk	Fat	Fat	Milk	Fat	Fat
	No.	Pct.	Pct.	No.	Lbs.	Pct.	Lbs.	Lbs.	Pct.	Lbs.
Ayrshire	65	61.5	58.5	9,716	10,340	4.11	425	10,175	4.10	417
Guernsey	398	46.2	49.7	47,659	8,776	4.82	423	8,848	4.79	424
Holstein	1,351	46.3	49.6	498,996	12,806	3.68	471	12,877	3.67	472
Jersey	266	48.9	52.6	27,502	8,323	5.20	433	8,316	5.19	432
Brown Swiss	109	47.7	52.3	7,506	11,197	4.12	461	11,072	4.10	454
Milking Shorthorn	20	45.0	60.0	192	8,775	3.90	342	8,777	3.83	336
Red Dane	2	50.0	50.0	6	11,370	3.88	441	11,482	3.72	427
Overall	2,211	47.1	50.5	591,577	11,352	4.01	455	11,396	3.99	455

Table 4.--Performance of non-AI sires summarized in March 1964, as measured by the production of progeny and their herdmates

Breed	Sires			Daughters with Herdmates	Daughters Average Production			Herdmates Average Production		
	Total	Milk Yield Maintained or increased	Fat Yield Maintained or increased		Milk	Fat	Fat	Milk	Fat	Fat
	No.	Pct.	Pct.	No.	Lbs.	Pct.	Lbs.	Lbs.	Pct.	Lbs.
Ayrshire	258	48.4	54.7	3,371	9,961	4.10	408	9,973	4.06	405
Guernsey	1,340	45.2	49.9	19,210	8,840	4.84	428	8,903	4.82	429
Holstein	4,332	45.2	48.5	70,690	12,958	3.67	475	13,082	3.65	478
Jersey	908	42.0	44.6	13,497	8,155	5.22	426	8,279	5.21	431
Brown Swiss	240	50.4	55.8	3,120	11,089	4.11	456	11,094	4.08	453
Milking Shorthorn	67	41.8	55.2	700	8,809	3.79	334	8,782	3.78	332
Red Poll	1	100.0	100.0	11	9,560	4.03	385	8,213	4.02	330
Other	2	50.0	0.0	11	9,440	3.93	371	9,735	4.04	393
Overall	7,148	45.0	48.8	110,610	11,365	4.01	456	11,468	3.99	458

TABLE 5.--NUMBER OF SIRE RECORDS SUMMARIZED 03-64, BY STATE AND BREED

STATE	AYRSHIRE	GUERNSEY	HOLSTEIN	JERSEY	BR. SWISS	SHORTHORN	RED DANE	OTHER	RED POLL	TOTAL
MAINE	32	65	286	52	12	4				451
NEW HAMPSHIRE	54	60	325	62	14	5				520
VERMONT	66	102	574	171	34	5				952
MASSACHUSETTS	55	106	527	97	34	1				820
RHODE ISLAND	26	27	179	27	2					261
CONNECTICUT	54	160	508	68	33					823
NEW YORK	105	243	1,621	187	59	3	1	2		2,221
NEW JERSEY	11	141	565	60	42					819
PENNSYLVANIA	97	425	1,316	152	54	8				2,052
OHIO	27	165	546	134	52	5				929
INDIANA	17	128	414	87	45	5				696
ILLINOIS	39	217	675	103	78	12			1	1,125
MICHIGAN	19	146	867	107	52	8	2			1,201
WISCONSIN	30	252	1,212	93	99	16				1,702
MINNESOTA	53	163	827	90	72	21				1,226
IOWA	56	163	761	127	113	26				1,246
MISSOURI	1	107	353	77	19	7				564
NORTH DAKOTA	1	19	181	3	20	3				227
SOUTH DAKOTA	11	11	212	17	29					280
NEBRASKA	6	75	327	23	41	8				480
KANSAS	39	83	424	53	44	13				656
DELAWARE	17	44	223	12	13					309
MARYLAND	46	188	778	50	49	4				1,115
VIRGINIA	40	199	718	70	28	3				1,058
WEST VIRGINIA	20	46	306	34	2					408
NORTH CAROLINA	31	164	486	111	30	1				823
SOUTH CARCLINA	8	158	282	83	27	1				559
GEORGIA	20	79	331	64	28					522
FLORIDA	10	152	179	86	17					444
KENTUCKY	3	54	323	76	14					470
TENNESSEE	7	120	233	141	24	5				530
ALABAMA	11	88	207	91	12	2				411
MISSISSIPPI	15	74	77	100	9					275
ARKANSAS	5	32	89	34	2	5				167
LOUISIANA		87	80	46	5					218
OKLAHOMA	16	43	206	50	13	12				340
TEXAS	24	53	335	115	33					560
MONTANA	2	20	56	6	14					98
IDAHO	3	70	194	68	14	7				356
WYOMING		3	32							35
COLORADO	13	60	217	36	36	2				364
NEW MEXICO		49	60	17						126
ARIZONA	1	51	153	17	8					230
UTAH	4	50	238	36	4					332
NEVADA		9	15	27						51
WASHINGTON	17	127	268	84	17	4				517
OREGON	4	93	190	113	20	4				424
CALIFORNIA	2	80	159	47	1					289
PUERTO RICO			20							20
HAWAII			3							3
ALASKA			4		3					7
TOTAL	325	1,746	5,713	1,185	350	89	2	2	1	1/ 30,312 2/ 9,413

1/ Represents the number of individual sire records sent to States.
2/ Represents the number of sires summarized.